



METHOD FOR HIGH-YIELD PRODUCTION OF MEGAKARYOCYTES

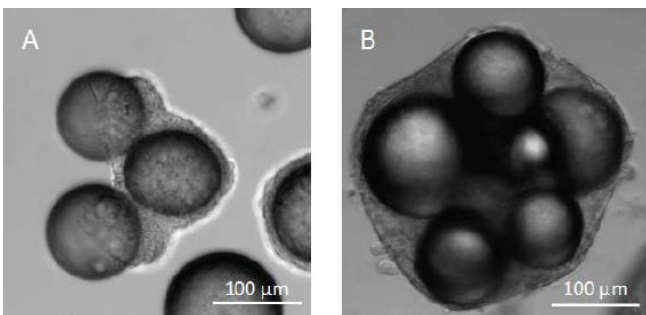
Keywords: megakaryocytes, thrombocytopenia, pluripotent stem cells, platelets

INVENTION NOVELTY

Researchers from Hannover Medical School successfully developed a novel process for effective production of megakaryocytes from induced pluripotent stem cells (iPSCs).

VALUE PROPOSITION

Blood thrombocytes (platelets) are produced from megakaryocytes and are essential for blood clotting. Therefore, patients suffering from thrombocytopenia require thrombocyte infusions on a regular basis. Since *in vitro* processes for manufacturing of platelets have been very ineffective so far, mainly blood and thrombocyte donations from human donors serve as a source for these infusions, which limits availability and is relatively costly. The novel technology overcomes these limitations by facilitating very effective differentiation and production of megakaryocytes from iPSCs and therefore represents a promising alternative for safe and large-scale production of thrombocytes.



Microscopic analysis of cell-MC-aggregates in the beginning (A) and at the end (B) of the differentiation protocol.

TECHNOLOGY DESCRIPTION

The novel technology comprises generation and purification of megakaryocytes from induced pluripotent stem cells (iPSCs) using microcarrier beads in stirred bioreactors. Due to the novel process, megakaryocyte yields can be significantly increased and generated cells can be further cultivated to produce high amounts of platelets. Furthermore, the produced megakaryocytes and/ or platelets can be irradiated to reduce risk of contaminations, e.g. with prokaryotes or viruses, without significantly reducing their *in vivo* function. Therefore, with the novel technology megakaryocytes and derived platelets can be generated in a safe, cost-efficient and unlimited fashion.

COMMERCIAL OPPORTUNITY

In-licensing or collaboration for further development is possible.

DEVELOPMENT STATUS

Megakaryocytes and platelets could be successfully produced and purified using the technology.

PATENT SITUATION

Patent applications in EP and US are pending based on PCT/EP2019/061263 with priority of 2018.

FURTHER READING

Eicke *et al.* (2018) Large-scale production of megakaryocytes in microcarrier-supported stirred suspension bioreactors. *Sci Rep.* 2018 Jul 5;8(1):10146

